paraplegia, as happened in the case mentioned by Mr. Hilton (*Rest and Pain*, p. 33), of a man who had a fall upon his back at Epsom, from the giving way of a scaffold. He immediately experienced the sensation of "pins and needles" in his legs. Being a most energetic man, he arose and ran six miles. He had been told, when a boy, that if he ever had an accident of this kind he should run off its effects as soon as possible. In a very short time, however, unequivocal spinal-marrow symptoms ensued, which resulted in complete and irremediable paraplegia.

Finally, it should be stated in regard to *contusions of the brain* that their symptoms have been described with sufficient copiousness in connection with the various examples which have been presented above; also, that the principal indications for their treatment are, (1) to prevent consecutive encephalitis, (2) to control such inflammation by remedial measures of sufficient energy should it unhappily supervene, and (3) to draw off the products of such inflammation (*e. g.*, purulent matter, etc.) by trephining the skull, and puncturing the cerebral membranous and cerebral substance whenever they cause paralysis on the opposite side of the body by compressing the cerebral substance, whether coma be likewise present or not, for a cerebral abscess never spontaneously gets well.

17 Clinton Place, April, 1883.

Article III.

A Demonstration of the Feeble Influence of Iodine over Malarial Fevers, based upon an Analysis of 76 Cases of Intermittent and Remittent Fevers treated with the Agent.

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There have recently appeared numerous reports from medical men in various parts of the world, reciting the virtues of iodine in the treatment of malarial fevers. It is true that these do not all agree as to the exact degree of reliance that may be placed in this agent as an antiperiodic. There are, however, those who claim for it an efficacy not less than that of the preparations of Peruvian bark, as far as the immediate control of the attack is concerned; even greater than that of these agents in preventing its recurrence. Such was the experience of Dr. Grinnell, who treated 140 cases of malarial fever at the Wichita agency, Indian Territory (*Braithwaite's Retrospect*, vol. 83), as well as that of Dr. W. M. Anderson (*Proceedings of Med. Soc. of Kings County*, 1879–80), who treated at the South Brooklyn Dispensary, over 200 cases, of whom "a large percentage returned . . . . enough to show, with private patients, that the results were not merely *post* but *propter hoc*." Dr. R. B. Morison reports highly gratifying results from the administration of 15-minim doses of tincture of iodine, in 250 malarial cases treated during 1881. Of the whole number, 150 were not heard from after the first visit, but of the 100 who returned once, twice, or oftener, 84 were on record as cured, 2 as not cured, and 12 as not cured either with iodine or cinchonidia. Dr. Morison was so favourably impressed with the action of iodine in the treatment of acute malarial diseases, that it was employed to the exclusion of other remedies in his service in the out-patient department of the University of Maryland, where his cases were treated (*Maryland Med. Journ.*, vol. 8, No. 20, p. 461).

Similar experience appears to have been acquired by Sircar (*Indian Med. Gaz.*), Gibbons (*Pacific Med. and Surg. Journal*, Sept. 1880), Bell (*Med. and Surg. Reporter*, Phila. 1881, xlv.) (in chronic malarial poisoning), Geoghan (*Albany Medical Annals*, 1880, iii.), who successfully treated 41 out of 43 cases of intermittent fever, Kemper (*Amer. Practitioner*, xviii. 1878), Wadsworth (*N. Y. Med. Journ.*, 1879, p. 493), and others. Willibrand (Virchow's *Archiv*, xlvii. p. 243) declares that in iodine we possess a specific remedy for malarial diseases equal to cinchona. Stillé and Maisch extol the anti-malarial virtues of iodine, and Bartholow (in the 4th edition of his *Mat. Med.*, 1882, p. 222–223), pronounces in its favour, relying, however, it would seem, more upon the testimony of others than upon his own experience.

It must be confessed, however, that the results of the writers quoted do not entirely agree. Here we find an assertion that it is in chronic malarial poisoning that iodine does its work most effectually; there, that its value in this variety is nothing; in another article we find that the drug is recommended to render permanent the cure that quinine has begun; in still another, that it is given in combination with quinine, arsenic, etc. On the other hand, we find that anti-periodic properties are denied to iodine by some. Thus, Fridenburg (Mt. Sinai Hospital Reports, *N. Y. Med. Journ.*, 1880, xxxi. p. 50) obtained no good results from its use; and Bannergee in the *Calcutta Med. Gaz.*, Jan. 1882, relates a very interesting experience with iodine in the treatment of malarial complaints. In 1878, Bannergee tried it in 7 cases with but a single successful result. In 1879, he used iodine in 500 cases with very satisfactory results (90 per cent. of cures). In 1880, he used it again in nearly 160 cases, but without as great success. He now recognized that many of these fevers were of an ephemeral character, and tended to limit themselves, and arrived at the conclusion that about 20 per cent. of cases are cured spontaneously either on the 3d, 4th, or 5th day, or sometimes even on the 7th or 8th day. He concludes that iodine is much inferior in the treatment of these maladies to quinine.

Attracted by the testimony in its favour, and with the desire to definitely ascertain the powers of iodine as an anti-malarial remedy, in view of the ease of its administration, and of its comparatively small commercial value, we availed ourselves of the opportunity of treating malarial fevers, afforded at Bayview Asylum, Baltimore, during the late summer and autumn of the past year (1882). We were the more impelled to test the merits of the remedy, upon the one hand, on account of the very unsatisfactory character of the evidence in its support, relating either to dispensary practice or to general results, and, upon the other hand, because of the exceptionally favourable opportunities at our command of observing a large number of cases of malarial fever throughout their course, and of closely studying the effects of treatment. Our cases came under observation during July, August, September, and October, and were largely composed of foreign labourers who had contracted their fevers while employed in fruit and vegetable canning establishments in highly malarious sections of the neighbouring country. They number 76 cases of intermittent and remittent fevers, and their appended histories, with the carefully recorded reports of the effects of treatment, clearly demonstrate the very feeble influence of iodine over malarial diseases; at least over the acute forms, for with the treatment of chronic malarial poisoning with iodine we have had but limited experience.

As stated, we treated in all 76 cases of malarial fever with the tincture of iodine. The doses given varied with the demands of each case. Usually, the dose was thirty drops (15♏) of the officinal tincture of iodine four times daily. Our plan was to give the iodine in this dose steadily for five days, and if, at the end of that period, a cure had not been effected, to substitute the sulphate of cinchonidia. We have preferred to classify and analyze our cases, rather than to report the full history of each case as recorded, in order to avoid a tiresome and uninteresting lengthening of our article.

Of our 76 cases, we record only 16 as cured by iodine. An analysis of these 16 cases, however, will show that recovery can by no means in all of them, with certainty, be ascribed to the remedy. For, apart from the well-known tendency of sufferers from chronic malarial poisoning to develop irregular paroxysms of ague, it is a matter of some doubt whether one or two of them had malarial fever at all. It is evident that uncertainty may well exist where one paroxysm of fever is *reported* to have occurred, while there will be but little difficulty in definitely determining the nature of cases whose symptoms afford repeated opportunities for recognition. The cases referred to belong to the early period of our observations, and, though lacking the definiteness so desirable in scientific research, we have concluded to report them for what they are worth. In five only of our sixteen "cures" was the attack stopped at once. These were Cases III., IX., XV., XLIV., and L. of our records. Case III. reported irregular attacks of ague for more than two years.

She had also chronic Bright's disease. Case IX. had chronic malarial poisoning, and claimed to have had "dumb ague" for two weeks. One of the house physicians observed her with a single high temperature. She was given twenty-five drops of tincture of iodine thrice daily for several days, and had no return of the paroxysms. Case XV. gave a history of two tertian chills. Twenty-five drops of the tincture were given thrice daily. By the time of the next expected chill he had taken three doses of the remedy. These were not sufficient to prevent it. His temperature reached 102° F., but after this he had no more fever. Case XLIV. was a half-starved individual who had been treated two weeks previously for tertian fever with quinine. After admission he had one attack, with a temperature of 100°, at the regular time. Thirty drops of the tincture were given thrice daily, and he had no return of the ague. Case L. had a single chill after admission, and was given the iodine immediately. He had no subsequent paroxysm. It will be observed that of these, Cases III. and IX. were subjects of chronic malarial intoxication, and that the single chill observed in each may have been one of its manifestations.

Four more of these sixteen cures occurred after from two to three days' treatment. They were Cases II., VII., XXXI., and XLVIII. An element of doubt also accompanies them. One (Case II.), a woman, asked admission to the hospital ward on account of a chill which she claimed to have had. This was denied her, and she was ordered to take fifteen drops of the tincture of iodine thrice daily. She reported one more tertian chill. She was seen within two hours of each of these reported attacks, but had no fever either time. Case VII. had well-marked chills on the first and third days of observation. He was given thirty drops of the tincture thrice daily, and remained free from fever after the second attack. Case XXXI. gave a history of double tertian ague of four weeks' duration. He was given thirty drops of the tincture thrice daily. He reported a chill during each of the first two afternoons of his stay in the hospital, but was contradicted by the ward master. His temperature, taken four hours after each asserted chill, was 100.6° and 98.4°. Case XLVIII. took the tincture in doses of thirty drops four times daily for three days, when it had to be stopped on account of the nausea it occasioned, even in reduced doses. He had a chill during the evening before treatment was begun, with a temperature of 102.8°, and chills on the second and third days, with temperatures of 104° and 103.4°. Although the medicine was now stopped on account of the nausea, he had no more ague during the period he remained with us.

We have hesitated to report Cases II., III., IX., and XXXI. of these nine "cures," but give them, desirous of yielding to the "iodine treatment of malarial fever" all the credit it can possibly deserve. Cases I., IV., XXXV., and LVIII. were cured after a treatment lasting more than three days. Case I. had a chill daily for six days, with temperature varying from 103° to 105.2°. During five days he took twenty-five drops, afterwards thirty drops of the tincture thrice daily. On the seventh and eighth days he had evening temperatures of 100.6°, but no chill. After this his temperature remained normal. Case IV. had, for six successive days, a chill in the morning of one day and in the afternoon of the next (double tertian), with temperatures varying from 102° to 103°. On the seventh day he missed his chill, but had one on the evening of the eighth day. This was his last. He took at first fifteen drops thrice daily. The dose was gradually increased to twenty, twenty-five, and thirty drops thrice daily. Case XXXV. took forty drops four times daily, and had a chill on each day for four days, with temperatures of 102.2°, 104°, 102°, 102°, after which it became normal. Case LVIII. took twenty drops of the tincture thrice daily. He had chills on the second and fourth days, with temperatures of 105° and 102°. On the sixth day he had a temperature of 100°, but no chill, and became convalescent.

The remaining three cures were of remittent fevers. In two of these iodine seems to have had an immediate influence, the temperature falling to normal soon after beginning treatment, remaining so, however, but a short time. The exacerbations soon recommenced, and the final reduction to normal condition in all three cases was accomplished by a *gradual reduction of the violence of the exacerbations and of the height of the temperature.* Case XXI. took thirty drops four times daily. After two doses his temperature fell from 102.4 to 99.4° on the morning of the second day. That evening it rose again to 100°; next evening to 102.7°; on the fourth evening it was 102°; on the morning of the fifth day it was 101.2°. It then fell to normal and remained so for six days, when the patient was discharged. This man had had malarial intoxication for three months. It is, therefore, not impossible that the attack was a manifestation of chronic malaria with spontaneous subsidence. We credit the tincture of iodine with the cure, however. Case LXI. took twenty drops of the tincture thrice daily. His thermal line was: First day, M., 101°, E., 104°; second day, M., 98.2, E., 102.4°. It now became normal, and remained thus for two days, when it again reached 101°, and came down gradually as follows, viz.: 101°, 99.4°, 99°, normal. The remedy was taken throughout. Case XXVIII. took thirty drops four times daily. His morning temperature was always from 1° or 2° below that of the evening It became normal on the sixth day. As shown by the following thermal line, the evening temperature fell to normal on the eighth day: 103.6°, 103.3°, 103°, 102.1°, 101.8°, 100°, 100°, 99.2°. This case shows clearly the *gradual* reduction of which mention has been made, and which will be further observed when relapses of remittent fever are considered.

Thirteen cases, eight intermittent and five remittent fevers, seemed at first to be benefited by the iodine, but the improvement was not permanent. Of the intermittents, six were quotidian and two tertian. Of the quotidian fevers, Case XVIII. took twenty drops of the tincture four times daily. The chills ceased after three days and recurred after five days, the patient taking the remedy all the while. On the fifth day at the usual chill time, the temperature was 101°, and at the same time next day it was 103°. This case resisted all remedies, including cinchonidia and quinia, for, after we ceased to give the iodine, we gave these agents, checking the paroxysms at once, but subsequently a relapse occurred. Case XLI. took thirty drops of the iodine four times daily and had three chills, with temperatures of 106°, 104°, 102.8°. For six days after this last chill he continued to take iodine. He was then discharged. He was readmitted on the fourteenth day after his last paroxysm, with a return of his chills. He was again given iodine in twenty drop doses of the tincture thrice daily. He had two paroxysms, but no more while under observation. Case XLV. had two chills, with temperature of 104°, while taking the tincture of iodine in thirty drop doses four times daily. The attack did not recur on the third day, but he had chills on the fourth and fifth days, with temperatures of 104° and 104.8°. The sulphate of cinchonidia was now given, whereupon the paroxysms ceased, and did not return. Case XLVI. took thirty drops four times daily. He had one chill, with a temperature of 104°. He remained without attack until the fifth and sixth days, when he had chills with temperatures of 104.6° and 101.8°. On the sixth day he was given cinchonidia. He had a chill on the seventh day, and no more during the week he remained under observation. Case XLIX. had two quotidian chills while taking twenty drops thrice daily. He continued to take iodine for four days. Nine days after the last paroxysm he had another attack. Under the use of cinchonidia he had no further trouble. Case LII. had three daily chills, and took thirty drops of the tincture four times daily. He escaped a chill upon the fourth day, but had one on the fifth day, with a temperature of 104.2°. He also had one on the sixth day. Iodine was now discontinued and sulphate of cinchonidia given. After this there was no further trouble. Of the two relapses of tertian intermittents, Case XVI. took thirty, twenty, fifteen, and ten drops of the tincture thrice daily, the dose being gradually reduced on account of nausea. He had one paroxysm, with a temperature of 100.2°, after beginning to take the iodine. On the seventh day (after nausea had compelled us to discontinue the medicine), and nearly eleven days after the last paroxysm, he had a chill with a temperature of 101°. Cinchonidia was now given. He had a chill upon the first day, but no more for the three months during which he remained in the institution. Case LIII. showed rather a postponement of the attack than a relapse. He had chills on the second, fourth, sixth, and eighth days, while taking thirty drops of iodine four times daily. He had no chill upon the tenth day, but the chills recurred upon the eleventh and thirteenth days, when cinchonidia was substituted with prompt results.

Each one of the five cases of remittent fever was taking iodine at the time of the relapse. As may be seen by the thermal records that follow, the violence of the exacerbations was becoming daily less, and the temperature was gradually falling towards normal. The relapse was shown by a sudden rise of temperature. Case XXIII. took the tincture for five days, during which his evening temperature ranged from 99° to 100°. His morning temperatures were as follows: viz., 102°, 101.4°, 101°, 100.4°, 99°. Upon the sixth day, the morning temperature was 100.6°, the evening temperature 102°. Cinchonidia was now given. He had one more paroxysm with a temperature of 100.6°, and that was all. Case XXXIX. had a temperature of 100°, and gave a clear history of previous malarial disease. Thirty drops of the tincture were given four times daily, and the temperature fell to normal limits within four days. For the next three days it was as follows, viz.:—

5th day,	A. M.,	100° ;	P. M.,	100°
6th "	"	100.2 ;	"	102
7th "	"	100.7 ;	"	102.3

Cinchonidia was substituted, and the temperature became normal at once, and remained so during the week the patient continued under observation. Case XLIII. is best represented by the thermal line:—

1st day,	P. M., 104.8°.			
2d "	A. M.,	102° ;	P. M.,	104.4°
3d "	"	102 ;	"	103.6
4th "	"	101 ;	"	102
5th "	"	99.4 ;	"	101
6th "	"	100 ;	"	102.6
7th "	"	98.6 ;	"	103
8th "	"	100		

Cinchonidia was ordered, and during the four days he remained in the hospital he had no more fever. Upon a single occasion during the treatment the patient's urine contained albumen. Case XLVII. took thirty drops of the tincture four times daily. For four days there was no improvement, the morning temperature varying between 100° and 100.6°; the evening temperature between 102° and 103.4°. During the next two days there was a gradual fall, as follows, viz.: During the evening of the fourth day, 102.8°. Fifth day, A. M., 102°; P. M., 100°. Sixth day, A. M., 99.8°; P. M., 101.2°. During the next three days the fever continued with morning temperature from 99° to 100°, and evening temperature from 100.6° to 101.2°. On the morning of the ninth day the temperature was 98.4°, but during the evening it reached 103°.

Sulphate of cinchonidia was now given; the fever ceased at once, and did not recur during the two months he remained in the institution. Case LI. had had malarial intoxication a long while. He took thirty drops of the tincture of iodine four times daily. The subjoined table shows the gradual reduction of the temperature:—

1st day,	A. M.,	102°;	P. M.,	103°
2d "	"	99.4;	"	103
3d "	"	101	"	102
4th "	"	99.4;	"	101
5th "	"	98.4;	"	100

The temperature varied between 98–100° for four days, after which it increased for three successive evenings, as follows: 101°, 100.4°, 101°. Sulphate of cinchonidia was substituted for two days, without affecting the temperature, which on the eleventh day was 102° in the morning, and 102.8° at night. Sulphate of quinia was then given. The temperature became normal within forty-eight hours, and remained thus during the succeeding eight days of his stay in the hospital. This patient had splenic and hepatic engorgement. Each region was exceedingly tender on pressure. This tenderness the local application of the tincture seemed to benefit. In all these cases there was complaint of nausea, though vomiting was not produced. The addition of ten drops of laudanum to each dose secured toleration for the iodine in nearly all cases, and enabled us to continue its administration during the five days of trial.

Four cases, however, suffered so much nausea and vomiting that we were forced to discontinue the administration of iodine, while the physical prostration of a fifth patient impelled us to abandon its use before the period of trial was completed. Case X. had two tertian chills, for which he took twenty-five drops thrice daily. Upon the fifth day he suffered intense nausea, vomiting the iodine as soon as taken, even in fifteen-drop doses. He had a third chill upon the seventh day. Case XIII. commenced treatment by taking twenty drops thrice daily. Nausea set in, and doses of only ten drops were rejected. Troublesome diarrhœa also appeared, but yielded to opium. He had chills upon three successive days while taking iodine. Case XX. was first given thirty drops four times daily. After the first day he was unable to retain the drug, though reduced to fifteen-drop doses. After a day's rest the iodine was resumed in ten-drop doses with tincture of opium, but was always rejected. While taking the tincture he had four daily chills, with temperatures of 102°, 101°, 101.7°, 102.7°. For several days he vomited everything. Sulphate of cinchonidia was given as soon as it could be retained. During the following three days his temperature remained about 101°, and he developed puffiness of his eyelids, swelling of the abdomen, and albuminuria. The last symptom disappeared after four days, and convalescence was established without delay. Case XXXIII. took for three days thirty drops of the tincture four times daily. At the end of this period he became so prostrated that we were compelled to stop it. During its administration he had a chill each day with temperatures of 102.4,° 104.5°, 102°. Cinchonidia was substituted. He had a chill the next day, but no more. One more case must have especial mention. This patient, a young man, took thirty drops of the tincture of iodine four times daily. He had chills on the second and fourth days, but none on the sixth day, though he suffered greatly from nausea and vomiting. The dose was reduced to ten drops with laudanum, but he became quite unable to retain it. Swelling of the ankles and abdomen developed. An examination of the urine gave sp. gr. 1.008; intense iodine reaction, although the last dose had been given three days previously; *no albuminuria.* Two days later there were marked ascites, with general anasarca and pronounced albuminuria. The microscope revealed hyaline and finely granular tube-casts in large numbers. The symptoms of acute tubular nephritis developed. Albuminuria was present during eleven consecutive days, and was absent during the following six days. It was again present in minute quantities for two or three days, after which several examinations made during the following two months failed to discover it.

Four cases left the hospital before we had completed the trial of iodine. Case IV. took thirty drops four times daily, and had a chill each day for three days. He then left without permission. Case VIII. took thirty drops three times daily. He had three tertian chills, when he demanded his discharge and left. These cases should be classed with the failures. Case XXIX. had normal morning temperatures, and evening temperatures of 100–103°. By gradual reduction, while still taking iodine, this reached normal limits by the fourth day. He left the hospital the following day, and we were unable to determine the permanence of the cure. Case XLII. had normal morning temperatures, but his evening temperatures for five days were: 102.4°, 100°, 100°, 102.8°, 99°. This last was taken at four o'clock P. M., and indicated a rise of 1° in six hours. He took thirty drops four times daily. He left the hospital without warning.

We have now considered 39 of our 76 cases, and have certainly allowed to iodine all its most enthusiastic supporters could demand. We have given so much space to the "cures" and "relapses," because we wished to show in what manner iodine exercises the feeble influence it seems to exert as an antiperiodic. These 39 cases, it seems to us, fully demonstrate the feeble antiperiodic powers of iodine. The very work it accomplishes condemns it. In the 37 cases which follow we were unable to see the slightest benefit from its use. These cases compose 20 quotidians, 7 tertians, 3 double tertians (a paroxysm on *each* day, but corresponding in *time* and *severity* on *alternate* days), 2 triple tertians (two paroxysms on alternate days, and one on other alternate days), and 5 cases of remittent fevers.

Of the quotidian fevers: Case XI. took twenty-five drops for nine days. His evening temperature varied from 102° to 105°; morning temperature from 98° to 99°. Cinchonidia was substituted, and the chills ceased at once. Case XII. took twenty-five drops thrice daily. He had daily chills for five days, with temperature from 102° to 103°. After this he had evening temperature of 101° to 102° for four days without chills. Cinchonidia effected an immediate cure. Case XVII. took thirty drops four times daily, for five days. He had a chill each day, with temperatures from 102° to 105°. He was cured at once by cinchonidia. Case XXV. gave the same history as the preceding case. He was given thirty drops four times daily for five days, and had a chill each day, with temperature from 102° to 106°. He also was completely cured by cinchonidia, and at once. Case XXVII. took the same doses as the preceding patient. He had five daily chills, with temperature of 102° to 103°. Cinchonidia was then given with prompt relief. These 6 cases are typical of 13 more of the 20 cases of quotidian fever. Of these 13 cases, XXVI., XXXIV., XLIX., and LVI. took thirty drops four times daily for five days. In XLIX. it produced great nausea on the fourth day. The 9 other cases, LX., LXIII., LXIV., LXVI., LXX., LXXI., LXXIII., LXXV., LXXVI., took twenty drops thrice daily. These latter cases were treated after several cases of albuminuria had been observed, and we reduced the dose in consequence. All of them were able to take the iodine for five days, although some were fortified against its unpleasant effects by laudanum or carbolic acid. In each case there was a chill each day, the temperatures ranging from 101° to 106.5.° Cinchonidia checked every one of them. Case LVII. was the last of this series. Treatment was begun by the administration of thirty drops four times daily. This dose nauseated on the third day, and was reduced to twenty-five drops, with ten drops of laudanum to each dose. This he took with difficulty until the fifth day. He had daily chills in the afternoon, with temperatures of 104°, 104.6°, 101°, 103°, 102°. Cinchonidia promptly arrested the paroxysms, and he had no chill during the subsequent eighteen days, during which he remained under observation. The day after we discontinued the iodine his urine showed traces of albumen. This disappeared two days later, and did not return.

Of the cases of tertian ague not benefited by iodine, Case V. took fifteen drops thrice daily. This was increased to twenty-five drops on the third day, and to thirty drops, four times daily, on the fourth day. This was one of our first cases, and we administered the drug for thirteen days. For nine days the fever was tertian; during the last four days he had a chill each morning. The disease yielded at once to cinchonidia, and did not return. Case VI. was also one of our early ones, and we gave the tincture for ten days. As in the preceding case, the patient grew worse instead of better. After the first chill he took fifteen drops three times daily, and after his second chill twenty drops four times daily. On the fifth day, after a chill and high fever, the dose was increased to thirty drops four times daily. He had chills upon the sixth and eighth days, and upon the latter date, the dose was made thirty-five drops four times daily. He had a chill upon the *next* day, and the iodine was discontinued. Cinchonidia cured him at once. Case XXXII. took thirty drops of the tincture four times daily. He had on the first, third, fifth, and seventh days chills, with temperatures of 104.8°, 105.8°, 102.4° (seventh day not taken). Cinchonidia was substituted after the last chill, and he had no more. Case XXXVII. had chills on the first, third, fifth, and seventh days, with temperatures of 101° to 104°. The dose of the tincture at first was thirty drops four times daily. Diarrhœa appeared upon the fourth day, and nausea on the fifth, when the dose was reduced to twenty-five drops, with ten drops of laudanum. Abdominal pains were complained of. Cinchonidia stopped his chills at once, but there was a relapse later. Case XLVIII. took twenty drops thrice daily. He vomited this dose on the second day, but the addition of tincture of opium enabled him to retain it with difficulty. On the first, third, fifth, and seventh days he had chills, with temperatures from 102° to 103.6°. Cinchonidia stopped them at once. Case XXXVIII. took thirty drops, four times daily, for six days, and had chills on the second, fourth, and fifth days, with temperatures of 100° to 101°. These ceased as soon as cinchonidia was given. Case LXXII. took twenty drops thrice daily. He had chills on the mornings of the first, third, and fifth days, with temperatures of 103.8°, 103.2°, 103.5°. Cinchonidia was given with immediate relief.

Of the double tertians, Case XIX. took thirty drops of the tincture four times daily. On the first, third, and fifth days he had chills during the afternoon, with temperatures of 101.4°, 103.2°, 105.2°. On the second, fourth, and eighth days his chills began about 7 o'clock A. M., with temperatures of 105°, 102.6°, 103°. All evidence of the malady disappeared upon the administration of cinchonidia. Case XXIV. was, strictly speaking, more properly a "duplicated tertian" than a "double" tertian, as the two paroxysms occurred on the *same days*. This patient took thirty drops four times daily for four days; on the fourth day the dose was reduced to twenty drops, on account of nausea. On the second, fourth, and sixth days he had morning chills with temperatures of 100°, 102°, 102°, and on the afternoons of the same days more violent chills, with temperatures of 106.4°, 106.2°, 104°. After beginning to take cinchonidia he had one chill only, and then had no more trouble. The iodine was discontinued after the fifth day. Case LIX. had, on the evenings of the first, third, and fifth days, temperatures of 100°, 101°, 102°, without chills. On the afternoons of the second, fourth, and eighth days he had chills, with temperatures of 100°–102°. Cinchonidia was given, and he had no more chills.

Of the triple tertians, Case LXV. took twenty drops three times daily. On the first, third, and fifth evenings he had temperatures of 101°, 100.8°, 100.4°, without chills. On the second, fourth, and sixth days he had morning temperatures of 101°, 100.8°, 102°, and on the afternoons of the same days he had severe chills, with temperatures of 105°, 104.4°, 104.8°. In spite of cinchonidia (now given), he had on the eighth day a morning temperature of 103°, and an evening temperature of 102.8°, but no chill. This was his last attack. Case LXXIV. had a very violent attack, with great prostration. After taking thirty drops of the tincture of iodine thrice daily, he vomited his medicine, but took after this fifteen-drop doses with difficulty. For five days he had a chill each afternoon, with temperatures of 103.4°, 103°, 103°, 101.6°, 103°. On the second and fourth days he had, in addition to his afternoon chills, morning temperatures of 100.2° and 101.6°. He now took cinchonidia, and missed his chill on the seventh day, but it came on the evening of the eighth day with a temperature of 102.5°. This was the last.

Iodine failed to benefit five cases of remittent fever. Case XIV. took at first twenty-five drops of tincture of iodine thrice daily. On the third day the dose was increased to thirty drops four times daily, but was reduced on account of diarrhœa. For five days his morning temperature was 99.4° and less. The evening temperature varied between 101°–102°. Cinchonidia was given, and the patient at once got well. Case XXII. was the second patient who resisted both cinchonidia and quinine after the failure of iodine. His fever seemed to wear out at the end of three weeks. While taking thirty drops four times daily, the thermal line was: 1st day, A. M., 100°; P. M., 98°. 2d day, A. M., 98.6°; P. M., 101. 3d day, A. M., 102°; P. M., 101.8°. 4th day, A. M., 99°; P. M., 104.6°. 5th day, A. M., 99.4°; P. M., 100.6°. 6th day, A. M., 98.4°; P. M., 101°. After cinchonidia was substituted, the exacerbations became even greater. Quinine was next given, and the temperature fell only gradually to normal, reaching normal limits not until the end of the third week. Case XXX. began to take thirty drops four times daily. This had to be reduced to twenty drops on account of nausea. The subjoined thermal line shows no evidence of the "gradual reduction" already spoken of, but there seems to have been an intermittent element in the morning temperatures: 1st day, A. M., 100.7°; P. M., 104°. 2d day, A. M., 98.4°; P. M., 103°. 3d day, A. M., 101.6°; P. M., 104°. 4th day, A. M., 99°; P. M., 104°. 5th day, A. M., 101°; P. M., 103.4°. 6th day, A. M., 99°; P. M., 103°. 7th day, A. M., 100.2°; P. M., 101°. Cinchonidia was substituted for the iodine on the sixth day with prompt relief. Case LV. took thirty drops four times daily. On alternate evenings, for six days, his temperature was 100–101°. In spite of cinchonidia, it reached 101° on the eighth day, but he had no subsequent trouble. Case LXVII. took twenty drops of tincture of iodine thrice daily for six days. His thermal line was: 1st day, A.M., 99.4°; P. M., 103.6°. 2d day, A. M., 102.6°; P. M., 103°. 3d day, A. M., 98°; P. M., 97.8°. 4th day, A. M., 98.4°; P. M., 103°. 5th day, A. M., 97.6°; P. M., 99.7°. 6th day, A. M., 99.7°; P. M., 102.6°. The patient became entirely well immediately after taking cinchonidia.

This concludes the summary of our work. Before drawing our conclusions, we wish to answer an objection which may possibly be brought against our cases. This objection, indeed, has already been made by Dr. Gibbons, in the *Pacific Medical and Surgical Journal*, against Dr. Fridenburg's report adverse to the claims of iodine as an anti-periodic. Substantially it is this: The dose given is too large, produces nausea and vomiting, preventing thus absorption, and so enforcing failure. To this we would reply that of our sixteen "cures" nine were effected while the patients were taking *thirty drops four times daily*, and in two of these the dose was gradually increased from fifteen and twenty drops thrice daily after these latter doses had failed to benefit. The *severe* cases, the cure of which we have credited to iodine, all took from twenty-five to thirty drops four times daily. We can also state that, while complaints of nausea were heard from thirty patients, no case is recorded as a failure where the iodine was not retained, and where its absorption was not made manifest by abundant evidences of its presence in the urine. Finally, it will be remembered, our dose of thirty drops is a little less than fifteen minims, the dose with which Dr. Morrison obtained his excellent results. (*Md. Med. Journal.*)

When we add that in a few cases the local application of iodine seemed to lessen the hepatic and splenic pains, we have described all the good we could derive from its use in *acute* malarial poisoning. As to its utility in *chronic* malarial poisoning we are not able to speak. Many of its advocates have said that here it does its great work in preventing the paroxysms which occur at irregular intervals, and in curing and preventing the splenic and hepatic changes. This we were in no position to investigate. Not all its supporters, however, hold this view by any means. Some claim for it a power in *acute* malaria superior to that of Peruvian bark; others are content with putting the two agents upon an equality. Our experience has not confirmed either of these statements. We are enabled to compare, in a measure, Peruvian bark and iodine, inasmuch as we gave cinchonidia or quinine to 52 of our cases, composed of 12 of the 13 relapses after benefit from iodine, 2 of those in whom the drug set up intolerable nausea, 1 to whom we gave cinchonidia because he was failing, and the 37 cases who were not benefited in five days.

Comparing, then, the two agents, we find the following to be the results of our investigations: I. Of 52 cases of acute malarial fever which iodine failed to cure, cinchonidia arrested 38 promptly, and 10 after one paroxysm, but allowed a relapse in one case later. One case resisted cinchonidia for two days, and yielded at once to quinine. One continued to have a temperature of 101° for three days, but was suffering at the time from kidney trouble (XX.), while the last two resisted both cinchonidia and quinine, and wore themselves out in three or four weeks. (In regard to these last, one naturally thinks of typhoid fever. The *duration* of the fever, however, was the only characteristic of typhoid. Since this was the case, we made a diagnosis of remittent fever, although we failed to cure with quinine.) II. As to relapses, since our patients left early, we cannot speak with much assurance, specially as regards relapses after cures. However, of iodine this much we know: of 29 cases in which the slightest benefit accrued after the use of iodine, 13 relapsed, the intermittents on the 5th, 7th, 12th, and 14th days, while in the remittents the medicine seemed suddenly to lose all control over the fever.

A word about albuminuria. We found it in four cases. In each case, an examination of the urine, previous to giving iodine, had shown it to be healthy. In two of our cases the albumen was found only once, and in the other two it formed two very troublesome complication. The weight of authority seems to hold that albuminuria is not an ordinary complication in *acute* malarial poisoning. Dr. Bartholow (*Practice of Medicine*) speaks of a nephritic form of pernicious intermittent fever, and also states that albuminuria may result from chronic malarial poisoning. Bartels (*German Clinical Lectures*, New Syd. Soc., 1876, p. 211) says that, "in his experience malaria is the most frequent cause of chronic inflammatory enlargement of the kidney." In regard, however, to the occurrence of albuminuria in the course of an intermittent or remittent fever, Dr. McLean (*Reynolds's System of Medicine*) says, "it is extremely rare;" of remittent fever, Prof. DaCosta says (in his *Medical Diagnosis*), "at no stage does the urine contain albumen." In the Philadelphia *Medical News* of December 9, 1882, Dr. Fairfax Irwin (U. S. A.) gives an account of 90 cases of remittent fever which he treated in the South. Albuminuria did not occur in a single case. In view of these statements, in view of the fact that albumen was found in the urine after the iodine had been used, and since we always found the iodine in the urine while we were giving it, we are led to *suspect* that the iodine and albuminuria may stand in the relation of cause and effect.

There was a noticeable absence of pronounced "iodism" in our cases. Nausea, a few cases of diarrhœa, and some complaints about a "stuffy feeling like a cold in the head," and a "bad taste in the mouth" were the only symptoms of the malady with which we met.

Finally, from our experience we would draw the following deductions as to the use of iodine in *acute malarial poisoning*:—

(1) In intermittent fevers it has some feeble influence in controlling the paroxysms.

(2) It takes usually from three to eight days to exercise this influence.

(3) In *cures effected* there is great danger of a relapse; certainly as great as with Peruvian bark.

(4) It is certain to add to any existing diarrhœa or nausea, and is liable to cause each, if they do not already exist.

(5) In *remittents*, its effect, if any, is seen in a slow and gradual reduction of temperature, and this reduction is liable to sudden interruptions.

(6) In *both forms* of malarial fever it is infinitely inferior to either cinchonidia or quinine: certainly as regards the immediate control of the fever, and, as far as we were able to judge, as regards relapses also.

(7) From an economic point of view, the slowness and uncertainty of its action make its use in *hospital* practice fully as expensive as Peruvian bark.

(8) There seems to be some ground to believe that it can cause albuminuria.

(9) In the large majority of cases of ordinary acute malarial poisoning it has no influence whatever.

ARTICLE IV.

THE FIELD OF VISION.

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IT is well known that, when the eye is fixed upon a stationary object, we see clearly only that part looked directly at; while surrounding zones are seen with increasing indistinctness as we pass from the point of fixation to the periphery of the view, until a point is reached where everything fades from our sight. The area thus obtained with a single eye is the *field of vision*, which is a map of the visual power of the entire retina, from the macula lutea to the ora serrata. The visual field (which we will designate V. F.) furnishing, as it does, a reflected (inverted) image of the perceptive power of the whole eye, is interesting in health and important in disease; for we here have to deal with an organ intimately connected, both anatomically and physiologically, with the brain, that participates with many, if not most, of the pathological processes affecting the latter, and shows such participation in a clear and demonstrable manner. Various methods have been resorted to for mapping out the V. F. in such form as to admit of its being recorded on paper for permanent preservation. The fundamental principle is to have the eye under examination fixed upon a stationary point in front of it, while a movable object establishes the extreme limit of visual perception for the various meridians of the eye, thus mapping out the boundary of the V. F. A rough but convenient way is